

43

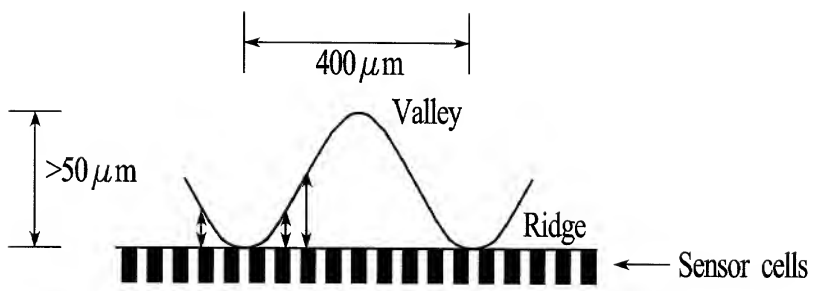


FIG. 1A



FIG. 1B



FIG. 1C

FIG. 1A is a schematic diagram of a sensor array. The sensor array includes a series of sensor cells (represented by the black bars) and a wavy surface (represented by the curve) that is positioned above the sensor cells. The wavy surface has a period of  $400\mu\text{m}$  and a height of  $>50\mu\text{m}$ . The sensor cells are positioned such that they can detect the wavy surface. FIG. 1B is a schematic diagram of a smooth sinusoidal wave. FIG. 1C is a schematic diagram of a noisy sinusoidal wave.

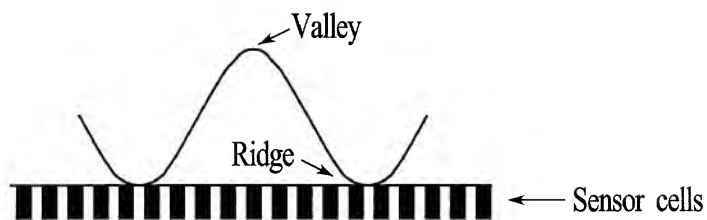


FIG. 1D



FIG. 1E

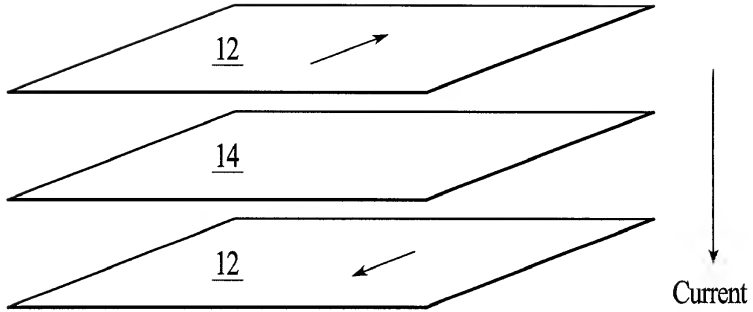


FIG. 2

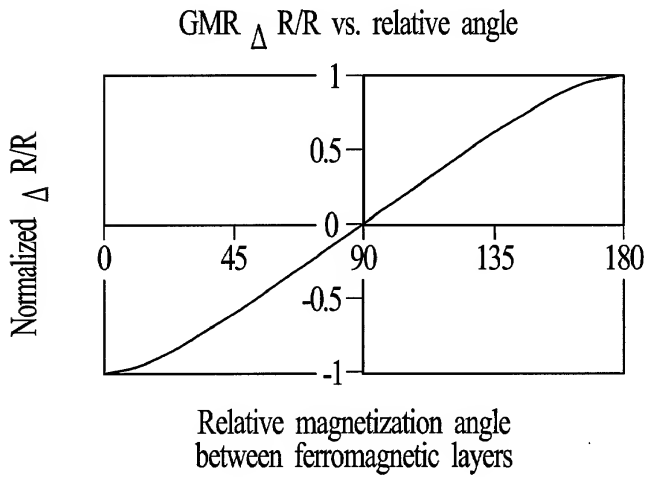


FIG. 3

Capping layer	<u>460</u>
Antiferromagnet layer	<u>450</u>
Ferromagnet layer	<u>440-5</u>
Ferromagnet layer	<u>440-4</u>
Spacer	<u>440-3</u>
Ferromagnet layer	<u>440-2</u>
Ferromagnet layer	<u>440-1</u>
Barrier layer	<u>430</u>
Ferromagnet layer	<u>420-5</u>
Ferromagnet layer	<u>420-4</u>
Spacer	<u>420-3</u>
Ferromagnet layer	<u>420-2</u>
Ferromagnet layer	<u>420-1</u>
Underlayer	<u>410</u>

FIG. 4

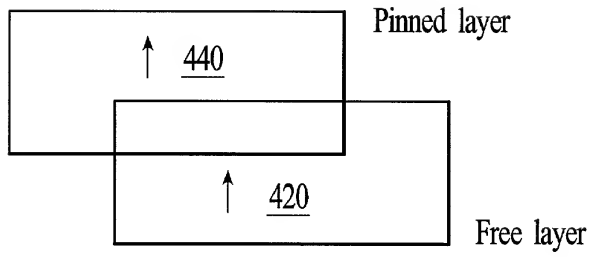


FIG. 5A

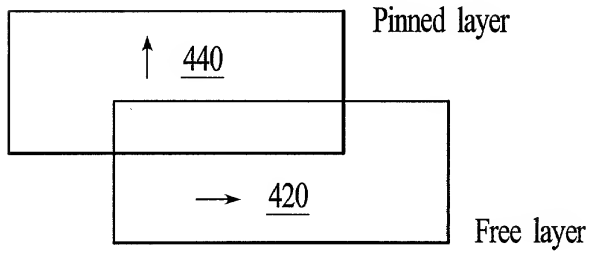


FIG. 5B

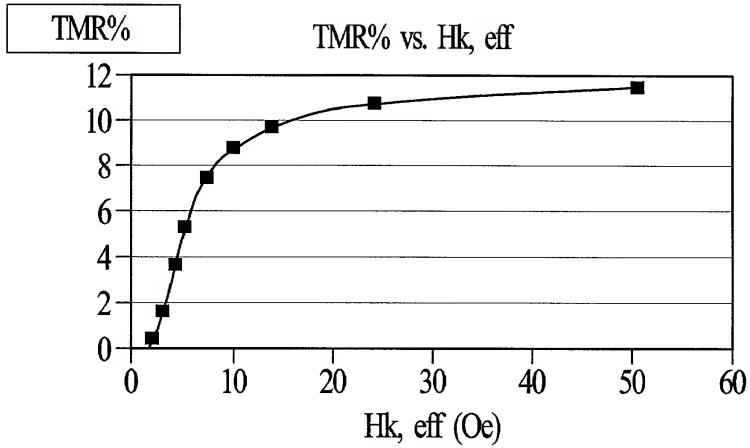


FIG. 6

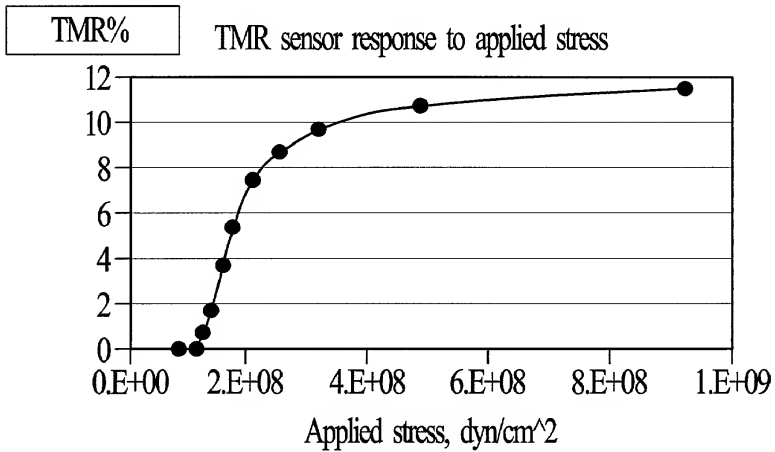


FIG. 7

Gauge factor

Gage factor of TMR sensor

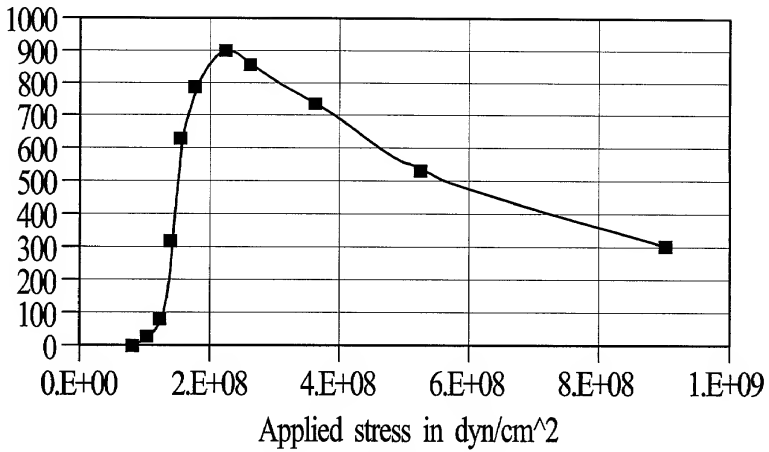


FIG. 8

Gauge factor

Gage factor vs. beam geometry

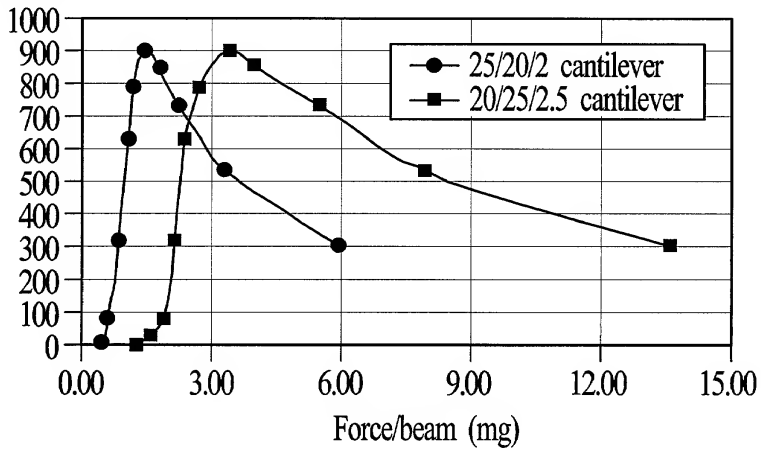


FIG. 9

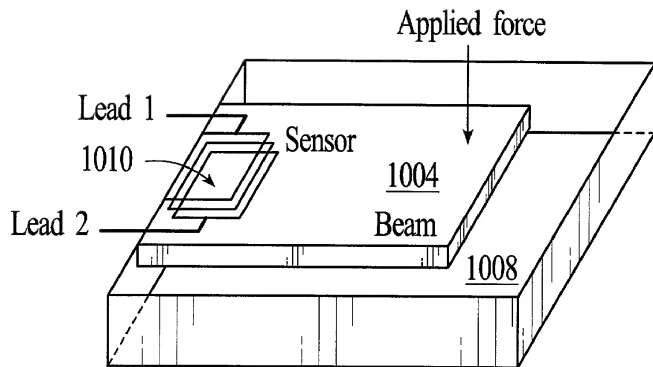


FIG. 10

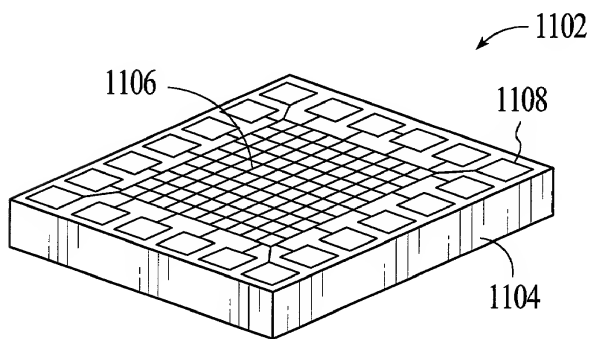


FIG. 11



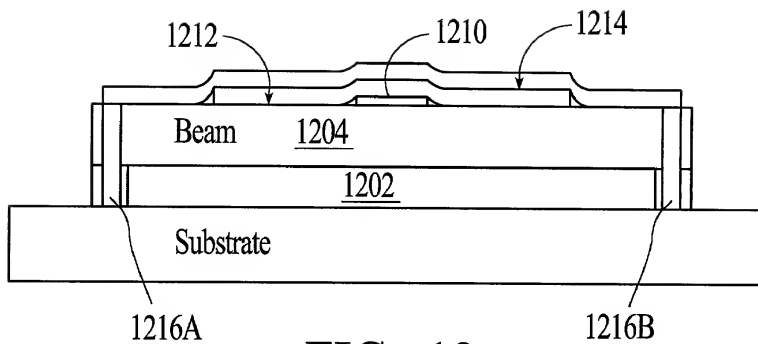


FIG. 12

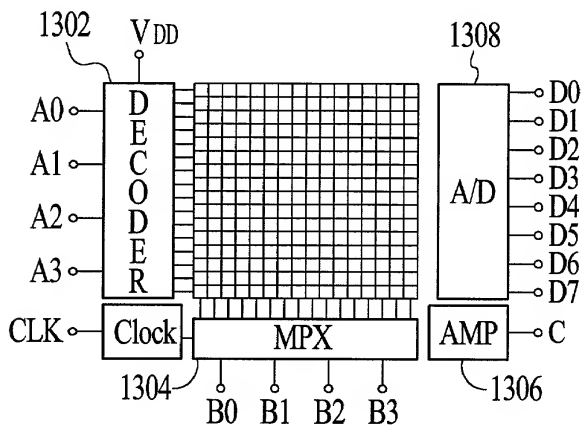


FIG. 13

FIG. 14A

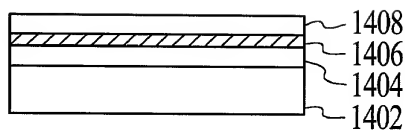


FIG. 14B

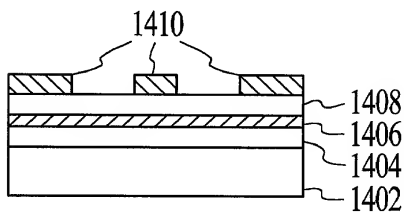


FIG. 14C

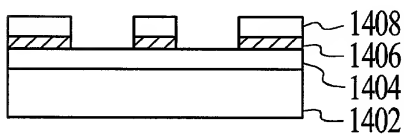


FIG. 14D

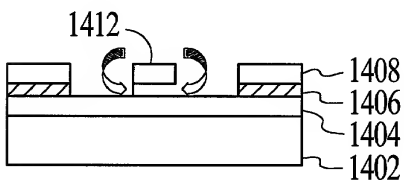


FIG. 14E

